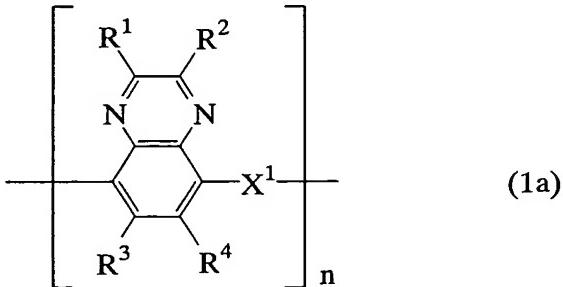


CLAIMS:

1. An electrode for an energy storage device comprising a polyaminoquinoxaline compound of the following formula (1a) as an electrode active material,

5 [Chemical Formula 1]



wherein R¹ and R² independently represent a hydrogen atom, a hydroxyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R¹ and R² are, respectively, the above-defined phenyl, pyridyl, biphenyl, naphthyl, thienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond;

R³ and R⁴ independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R³ and R⁴

are, respectively, the above-defined phenyl, pyridyl, biphenyl, naphthyl, thienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond;

5 X¹ represents -NH-R⁵-NH- or -NH-R⁶- wherein R⁵ and R⁶ independently represent a C₁-C₁₀ alkylene group, a -C(O)CH₂-, -CH₂C(O)-, a divalent benzene ring which may be substituted with Y, a divalent pyridine ring which may be substituted with Y, a divalent biphenyl group which may be substituted with Y, a divalent naphthalene ring which may be substituted with Y, a divalent thiophene ring which may be substituted with Y, a divalent pyrrole ring which may be substituted with Y, a furan ring which may be substituted with Y, or a condensed hetero ring which may be substituted with Y, in which Y represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different; and

10 n is an integer of 2 or over.

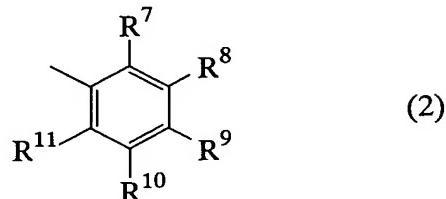
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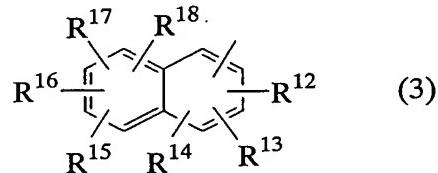
30

2. The electrode according to claim 1, wherein R¹ and R² independently represent a group of the following formula (2)
[Chemical Formula 2]



5 wherein R⁷-R¹¹ independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₄ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₄ cyanoalkyl group, a phenyl group which may be substituted with Z, a
10 naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a
15 thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

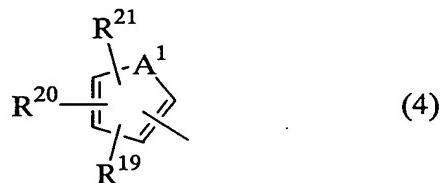
3. The electrode according to claim 1, wherein R¹ and R² independently represent a group of the following formula (3)
[Chemical Formula 3]



25 wherein R¹²-R¹⁸ independently represent, each substituted at an arbitrary position of the ring of the formula, a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted

with Z, a naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

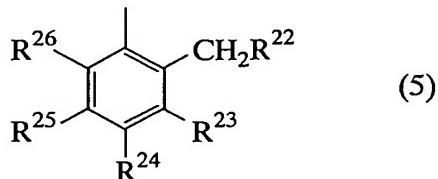
10 4. The electrode according to claim 1, wherein R¹ and R² independently represent a group of the following formula (4)
[Chemical Formula 4]



15 wherein R¹⁹-R²¹ independently represent, each substituted at an arbitrary position of the ring of the formula, a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group; and

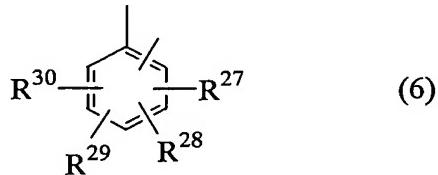
20 25 A¹ represents NH, O or S.

5. The electrode according to claim 1, wherein R¹ and R²
independently represent a group of the following formula (5)
[Chemical Formula 5]



5 wherein R²² represents a halogen atom or a cyano group, and
R²³-R²⁶ independently represent a hydrogen atom, a halogen
atom, a cyano group, a nitro group, an amino group, an epoxy
group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy
group, a phenyl group which may be substituted with Z, a
10 naphthyl group which may be substituted with Z or a thienyl
group which may be substituted with Z, in which Z represents
a halogen atom, a cyano group, a nitro group, an amino group,
an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀
haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl
15 group, a phenyl group, a biphenyl group, a naphthyl group, a
thienyl group, a pyrrolyl group, a furyl group or a condensed
heteroaryl group.

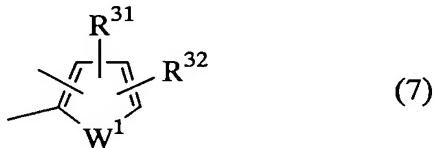
6. The electrode according to any one of claims 1 to 5,
20 wherein R⁵ represents a group of the following formula (6)
[Chemical Formula 6]



wherein R²⁷-R³⁰ independently represent, each substituted at
an arbitrary position on the ring of the formula, a hydrogen
25 atom, a halogen atom, a cyano group, a nitro group, an amino
group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a
C₁-C₁₀ alkoxy group, a phenyl group which may be substituted
with Z, a naphthyl group which may be substituted with Z or a

thienyl group which may be substituted with Z, in which Z
represents a halogen atom, a cyano group, a nitro group, an
amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl
group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀
5 cyanoalkyl group, a phenyl group, a biphenyl group, a
naphthyl group, a thienyl group, a pyrrolyl group, a furyl
group or a condensed heteroaryl group.

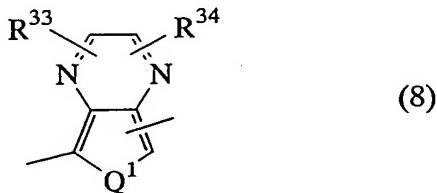
7. The electrode according to any one of claims 1 to 5,
10 wherein R⁵ represents a group of the following formula (7)
[Chemical Formula 7]



wherein R³¹-R³² independently represent, each substituted at
an arbitrary position on the ring of the formula, a hydrogen
15 atom, a halogen atom, a cyano group, a nitro group, an amino
group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a
C₁-C₁₀ alkoxy group, a phenyl group which may be substituted
with Z, a naphthyl group which may be substituted with Z or a
thienyl group which may be substituted with Z, in which Z
20 represents a halogen atom, a cyano group, a nitro group, an
amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl
group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀
cyanoalkyl group, a phenyl group, a biphenyl group, a
naphthyl group, a thienyl group, a pyrrolyl group, a furyl
25 group or a condensed heteroaryl group; and
W¹ represents NH, O or S.

8. The electrode according to any one of claims 1 to 5,
wherein R⁵ represents a group of the following formula (8)

[Chemical Formula 8]

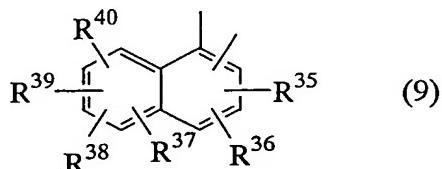


5 wherein R³³-R³⁴ independently represent, each substituted at
an arbitrary position on the ring of the formula, a hydrogen
atom, a halogen atom, a cyano group, a nitro group, an amino
group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a
10 C₁-C₁₀ alkoxy group, a phenyl group which may be substituted
with Z, a naphthyl group which may be substituted with Z or a
thienyl group which may be substituted with Z, in which Z
represents a halogen atom, a cyano group, a nitro group, an
amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl
group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀
15 cyanoalkyl group, a phenyl group, a biphenyl group, a
naphthyl group, a thienyl group, a pyrrolyl group, a furyl
group or a condensed heteroaryl group; and

Q¹ represents NH, O or S.

20 9. The electrode according to any one of claims 1 to 5,
wherein R⁵ represents a group of the following formula (9)

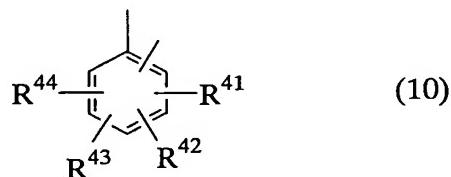
[Chemical Formula 9]



25 wherein R³⁵-R⁴⁰ independently represent, each substituted at
an arbitrary position on the ring of the formula, a hydrogen
atom, a halogen atom, a cyano group, a nitro group, an amino
group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a
C₁-C₁₀ alkoxy group, a phenyl group which may be substituted

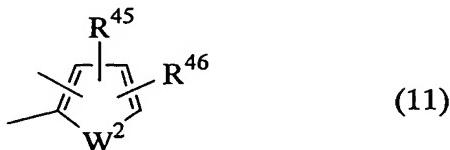
with Z, a naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

- 10 10. The electrode according to any one of claims 1 to 5, wherein R⁶ represents a group of the following formula (10)
[Chemical Formula 10]



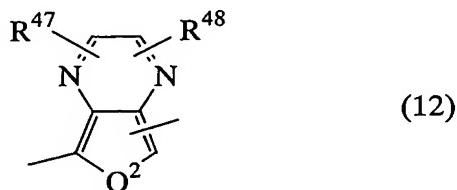
wherein R¹¹-R⁴⁴ independently represent, each substituted on an arbitrary position of the ring of the formula, a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

11. The electrode according to any one of claims 1 to 5,
wherein R⁶ represents a group of the following formula (11)
[Chemical Formula 11]



5 wherein R⁴⁵-R⁴⁶ independently represent, each substituted on
an arbitrary position of the ring of the formula, a hydrogen
atom, a halogen atom, a cyano group, a nitro group, an amino
group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a
C₁-C₁₀ alkoxy group, a phenyl group which may be substituted
10 with Z, a naphthyl group which may be substituted with Z or a
thienyl group which may be substituted with Z, in which Z
represents a halogen atom, a cyano group, a nitro group, an
amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl
group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀
15 cyanoalkyl group, a phenyl group, a biphenyl group, a
naphthyl group, a thienyl group, a pyrrolyl group, a furyl
group or a condensed heteroaryl group; and
W² represents NH, O or S.

20 12. The electrode according to any one of claims 1 to 5,
wherein R⁶ represents a group of the following formula (12)
[Chemical Formula 12]



25 wherein R⁴⁷-R⁴⁸ independently represent, each substituted on
an arbitrary position of the ring of the formula, a hydrogen
atom, a halogen atom, a cyano group, a nitro group, an amino
group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a
C₁-C₁₀ alkoxy group, a phenyl group which may be substituted

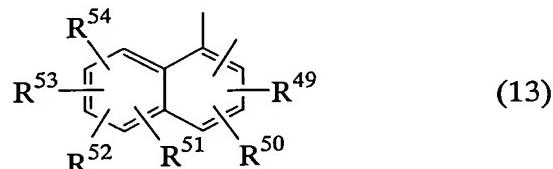
with Z, a naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group; and

Q² represents NH, O or S.

10

13. The electrode according to any one of claims 1 to 5, wherein R⁶ represents a group of the following formula (13)

[Chemical Formula 13]



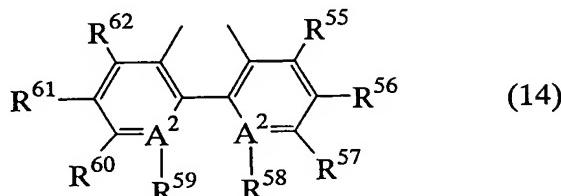
15 wherein R⁴⁹-R⁵⁴ independently represent, each substituted on an arbitrary position of the ring of the formula, a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

20

25

14. The electrode according to claim 1, wherein the group formed by bonding R¹ and R² through a single bond is represented by the formula (14)

[Chemical Formula 14]

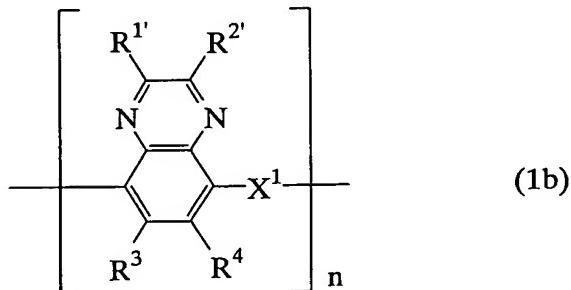


5

wherein A²'s are each C or N, R⁵⁵-R⁶² independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z or a thiienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group, provided that when A² represents N, R⁵⁸ and R⁵⁹ are both non-existent.

20 15. An electrode for an energy storage device comprising a polyaminoquinoxaline compound of the following formula (1b) as an electrode active material

[Chemical Formula 15]



(1b)

wherein R¹' and R²' join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- ,
-OCH₂CH₂- , -CH₂OCH₂- , -OCH₂O- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- ,
-CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- ,
-CH₂CH₂CH₂O- , -OCH₂CH₂CH₂- , -CH₂CH₂OCH₂- , -CH₂OCH₂CH₂- , -CH₂OCH₂O- ,
5 -OCH₂CH₂O- , -SCH₂CH₂S- , -OCH₂CH₂S- , -SCH₂CH₂O- , -CH₂CH=CH- ,
-CH=CHCH₂- , -OCH=CH- , -CH=CHO- , -SCH=CH- , -CH=CHS- ,
-N(R')CH=CH- , -CH=CHN(R')- , -OCH=N- , -N=CHO- , -SCH=N- ,
-N=CHS- , -N(R')CH=N- , -N=CHN(R')- , -N(R')N=CH- , -CH=N(R')N- ,
-CH=CHCH=CH- , -OCH₂CH=CH- , -CH=CHCH₂O- , -N=CHCH=CH- ,
10 -CH=CHCH=CH- , -N=CHCH=N- , -N=CHN=CH- , or -CH=NCH=N- wherein a
hydrogen atom bonded to a carbon atom of these groups may be
substituted with Y, and R' represents a hydrogen atom, a
C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀
cyanoalkyl group, a phenyl group which may be substituted
15 with Z, a pyridyl group which may be substituted with Z, a biphenyl
group which may be substituted with Z, a naphthyl
group which may be substituted with Z, a thiienyl group which
may be substituted with Z, a pyrrolyl group which may be
substituted with Z, a furyl group which may be substituted
20 with Z, or a condensed heteroaryl group which may be
substituted with Z;

R³ and R⁴ independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thiienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R³ and R⁴ are, respectively, the above-defined phenyl, pyridyl, biphenyl, naphthyl, thiienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond; and

X¹ represents -NH-R⁵-NH- or -NH-R⁶- wherein R⁵ and R⁶ independently represent a C₁-C₁₀ alkylene group, a -C(O)CH₂- ,

-CH₂C(O)-, a divalent benzene ring which may be substituted with Y, a divalent pyridine ring which may be substituted with Y, a divalent biphenyl group which may be substituted with Y, a divalent naphthalene ring which may be substituted with Y, a divalent thiophene ring which may be substituted with Y, a divalent pyrrole ring which may be substituted with Y, a furan ring which may be substituted with Y, or a condensed hetero ring which may be substituted with Y;

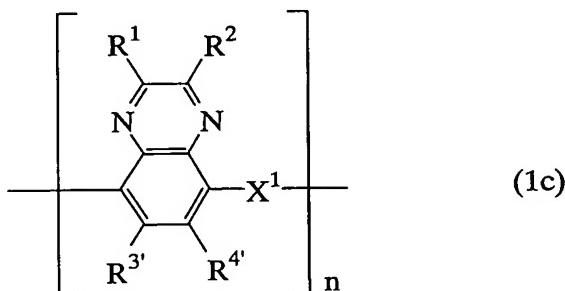
Y represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different;

Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different; and

n is an integer of 2 or over.

16. An electrode for an energy storage device comprising a polyaminoquinoxaline compound of the following formula (1c) as an electrode active material

[Chemical Formula 16]



5

(1c)

wherein R¹ and R² independently represent a hydrogen atom, a hydroxyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R¹ and R² are, respectively, the above-defined phenyl, pyridyl, biphenyl, naphthyl, thienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond;

R³' and R⁴' join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- ,
20 -OCH₂CH₂- , -CH₂OCH₂- , -OCH₂O- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- ,
-CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- ,
-CH₂CH₂CH₂O- , -OCH₂CH₂CH₂- , -CH₂CH₂OCH₂- , -CH₂OCH₂CH₂- , -CH₂OCH₂O- ,
-OCH₂CH₂O- , -SCH₂CH₂S- , -OCH₂CH₂S- , -SCH₂CH₂O- , -CH₂CH=CH- ,
-CH=CHCH₂- , -OCH=CH- , -CH=CHO- , -SCH=CH- , -CH=CHS- ,
25 -N(R')CH=CH- , -CH=CHN(R')- , -OCH=N- , -N=CHO- , -SCH=N- ,
-N=CHS- , -N(R')CH=N- , -N=CHN(R')- , -N(R')N=CH- , -CH=N(R')N- ,
-CH=CHCH=CH- , -OCH₂CH=CH- , -CH=CHCH₂O- , -N=CHCH=CH- ,
-CH=CHCH=N- , -N=CHCH=N- , -N=CHN=CH- , or -CH=NCH=N- wherein a
30 hydrogen atom bonded to a carbon atom of these groups may be substituted with Y, and R' represents a hydrogen atom, a

C_1-C_{10} alkyl group, a C_1-C_{10} haloalkyl group, a C_1-C_{10} cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z, or a condensed heteroaryl group which may be substituted with Z;

X¹ represents -NH-R⁵-NH- or -NH-R⁶- wherein R⁵ and R⁶ independently represent a C_1-C_{10} alkylene group, a -C(O)CH₂- , -CH₂C(O)-, a divalent benzene ring which may be substituted with Y, a divalent pyridine ring which may be substituted with Y, a divalent biphenyl group which may be substituted with Y, a divalent naphthalene ring which may be substituted with Y, a divalent thiophene ring which may be substituted with Y, a divalent pyrrole ring which may be substituted with Y, a furan ring which may be substituted with Y, or a condensed hetero ring which may be substituted with Y;

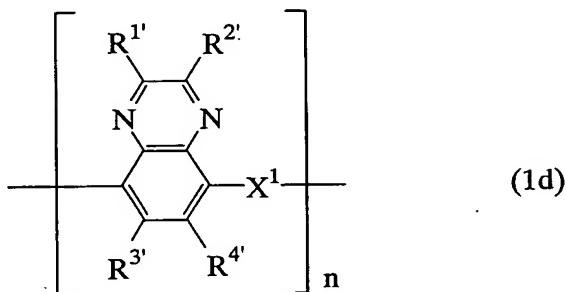
Y represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C_1-C_{10} alkyl group, a C_1-C_{10} haloalkyl group, a C_1-C_{10} alkoxy group, a C_1-C_{10} cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different;

Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C_1-C_{10} alkyl group, a C_1-C_{10} haloalkyl group, a C_1-C_{10} alkoxy group, a C_1-C_{10} cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl

group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different; and n is an integer of 2 or over.

- 5 17. An electrode for an energy storage device comprising a polyaminoquinoxaline compound of the following formula (1d) as an electrode active material

[Chemical Formula 17]



- 10 wherein R¹' and R²' join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- , -OCH₂CH₂- , -CH₂OCH₂- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- , -CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- , -CH₂CH₂CH₂O- , -OCH₂CH₂CH₂- , -CH₂CH₂OCH₂- , -CH₂OCH₂CH₂- , -CH₂OCH₂O- , -OCH₂CH₂O- , -SCH₂CH₂S- , -OCH₂CH₂S- , -SCH₂CH₂O- , -CH₂CH=CH- , -CH=CHCH₂- , -OCH=CH- , -CH=CHO- , -SCH=CH- , -CH=CHS- , -N(R')CH=CH- , -CH=CHN(R')- , -OCH=N- , -N=CHO- , -SCH=N- , -N=CHS- , -N(R')CH=N- , -N=CHN(R')- , -N(R')N=CH- , -CH=N(R')N- , -CH=CHCH=CH- , -OCH₂CH=CH- , -CH=CHCH₂O- , -N=CHCH=CH- , -CH=CHCH=N- , -N=CHCH=N- , -N=CHN=CH- , or -CH=NCH=N- wherein a hydrogen atom bonded to a carbon atom of these groups may be substituted with Y, and R' represents a hydrogen atom, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thiienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z, or a condensed heteroaryl group which may be substituted with Z;

R^{3'} and R^{4'} join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- ,
-OCH₂CH₂- , -CH₂OCH₂- , -OCH₂O- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- ,
-CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- ,
-CH₂CH₂CH₂O- , -OCH₂CH₂CH₂- , -CH₂CH₂OCH₂- , -CH₂OCH₂CH₂- , -CH₂OCH₂O- ,
5 -OCH₂CH₂O- , -SCH₂CH₂S- , -OCH₂CH₂S- , -SCH₂CH₂O- , -CH₂CH=CH- ,
-CH=CHCH₂- , -OCH=CH- , -CH=CHO- , -SCH=CH- , -CH=CHS- ,
-N(R')CH=CH- , -CH=CHN(R')- , -OCH=N- , -N=CHO- , -SCH=N- ,
-N=CHS- , -N(R')CH=N- , -N=CHN(R')- , -N(R')N=CH- , -CH=N(R')N- ,
-CH=CHCH=CH- , -OCH₂CH=CH- , -CH=CHCH₂O- , -N=CHCH=CH- ,
10 -CH=CHCH=N- , -N=CHCH=N- , -N=CHN=CH- , or -CH=NCH=N- wherein a
hydrogen atom bonded to a carbon atom of these groups may be
substituted with Y, and R' represents a hydrogen atom, a
C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀
cyanoalkyl group, a phenyl group which may be substituted
15 with Z, a pyridyl group which may be substituted with Z, a biphenyl
group which may be substituted with Z, a naphthyl
group which may be substituted with Z, a thiienyl group which
may be substituted with Z, a pyrrolyl group which may be
substituted with Z, a furyl group which may be substituted
20 with Z, or a condensed heteroaryl group which may be
substituted with Z;

X¹ represents -NH-R⁵-NH- or -NH-R⁶- wherein R⁵ and R⁶
independently represent a C₁-C₁₀ alkylene group, a -C(O)CH₂- ,
-CH₂C(O)- , a divalent benzene ring which may be substituted
25 with Y, a divalent pyridine ring which may be substituted
with Y, a divalent biphenyl group which may be substituted
with Y, a divalent naphthalene ring which may be substituted
with Y, a divalent thiophene ring which may be substituted
with Y, a divalent pyrrole ring which may be substituted with
30 Y, a furan ring which may be substituted with Y, or a
condensed hetero ring which may be substituted with Y;

Y represents a halogen atom, a cyano group, a nitro
group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀
alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a
35 C₁-C₁₀ cyanoalkyl group, a phenyl group which may be
substituted with Z, a pyridyl group which may be substituted
with Z, a biphenyl group which may be substituted with Z, a

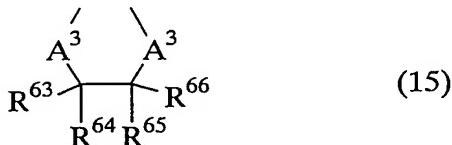
naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different;

Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different; and n is an integer of 2 or over.

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18. The electrode according to claim 15 or 17, wherein the group formed by joining R¹' and R²' together is of the formula (15)

[Chemical Formula 18]

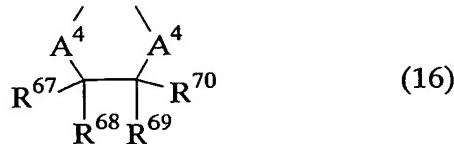


20

wherein A³ represents O or S, and R⁶³-R⁶⁶ independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z or a thienyl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

19. The electrode according to claim 16 or 17, wherein the group formed by joining R^{3'} and R^{4'} together is of the formula (16)

[Chemical Formula 19]

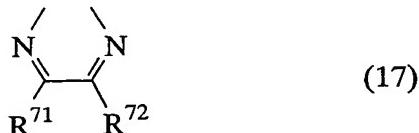


5

wherein A⁴ represents O or S, and R⁶⁷-R⁷⁰ independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z or a thiaryl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiaryl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

20. The electrode according to claim 16 or 17, wherein the group formed by joining R^{3'} and R^{4'} is of the formula (17)

[Chemical Formula 20]



wherein R⁷¹ and R⁷² independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z or a thiaryl group which may be substituted with Z, in which Z represents a halogen atom, a cyano group, a nitro group, an amino group,

an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group.

21. An energy storage device comprising an electrode for an energy storage device according to any one of claims 1 to 20.

10

22. A method for making an electrode for an energy storage device according to claim 1, which method comprising applying and building up, on a current collector electrode, an electrode active material made of a polyaminoquinoxaline compound represented by the afore-indicated formula (1a).

15

23. A method for making an electrode for an energy storage device according to claim 15, which method comprising applying and building up, on a current collector electrode, an electrode active material made of a polyaminoquinoxaline compound represented by the afore-indicated formula (1b).

20

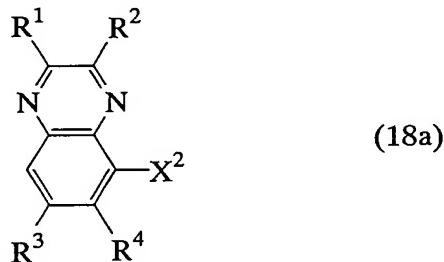
24. A method for making an electrode for an energy storage device according to claim 16, which method comprising applying and building up, on a current collector electrode, an electrode active material made of a polyaminoquinoxaline compound represented by the afore-indicated formula (1c).

25

25. A method for making an electrode for an energy storage device according to claim 17, which method comprising applying and building up, on a current collector electrode, an electrode active material made of a polyaminoquinoxaline compound represented by the afore-indicated formula (1d).

26. A method for making an electrode for an energy storage device as recited in claim 1 above, which method comprising electrolytically polymerizing an aminoquinoxaline compound represented by the formula (18a) on a current collector 5 electrode,

[Chemical Formula 21]



wherein R¹ and R² independently represent a hydrogen atom, a hydroxyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R¹ and R² are, respectively, the above-defined phenyl, pyridyl, biphenyl, naphthyl, thienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond;

R³ and R⁴ independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R³ and R⁴ are, respectively, the above-defined phenyl, pyridyl,

biphenyl, naphthyl, thienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond;

X² represents -NH-R⁷³-NH₂ or -NH-R⁷⁴, in which R⁷³ represents a C₁-C₁₀ alkylene group, a -C(O)CH₂-, -CH₂C(O)-, a divalent benzene ring which may be substituted with Y, a divalent pyridine ring which may be substituted with Y, a divalent biphenyl group which may be substituted with Y, a divalent naphthalene ring which may be substituted with Y, a divalent thiophene ring which may be substituted with Y, a divalent pyrrole ring which may be substituted with Y, a furan ring which may be substituted with Y, or a condensed hetero ring which may be substituted with Y, and R⁷⁴ a C₁-C₁₀ alkyl group, an acetyl group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y, or a condensed heteroaryl group which may be substituted with Y;

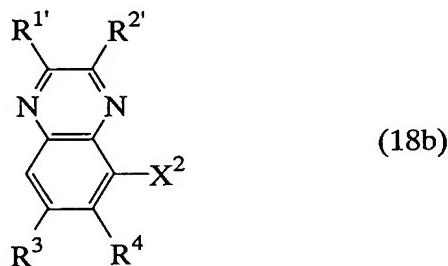
Y represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different; and

Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a

naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different.

- 5 27. A method for making an electrode for an energy storage device according to claim 15, which method comprising electrolytically polymerizing an aminoquinoxaline compound represented by the formula (18b) on a current collector electrode,

10 [Chemical Formula 22]



wherein R¹' and R²' join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- , -OCH₂CH₂- , -CH₂OCH₂- , -OCH₂O- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- , -CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- ,
15 -CH₂CH₂CH₂O- , -OCH₂CH₂CH₂- , -CH₂CH₂OCH₂- , -CH₂OCH₂CH₂- , -CH₂OCH₂O- , -OCH₂CH₂O- , -SCH₂CH₂S- , -OCH₂CH₂S- , -SCH₂CH₂O- , -CH₂CH=CH- ,
-CH=CHCH₂- , -OCH=CH- , -CH=CHO- , -SCH=CH- , -CH=CHS- , -N(R')CH=CH- , -CH=CHN(R')- , -OCH=N- , -N=CHO- , -SCH=N- ,
-N=CHS- , -N(R')CH=N- , -N=CHN(R')- , -N(R')N=CH- , -CH=N(R')N- ,
20 -CH=CHCH=CH- , -OCH₂CH=CH- , -CH=CHCH₂O- , -N=CHCH=CH- , -CH=CHCH=N- , -N=CHCH=N- , -N=CHN=CH- , or -CH=NCH=N- wherein a hydrogen atom bonded to a carbon atom of these groups may be substituted with Y, and R' represents a hydrogen atom, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z.

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with Z, or a condensed heteroaryl group which may be substituted with Z;

R³ and R⁴ independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R³ and R⁴ are, respectively, the above-defined phenyl, pyridyl, biphenyl, naphthyl, thienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond;

X² represents -NH-R⁷³-NH₂ or -NH-R⁷⁴, in which R⁷³ represents a C₁-C₁₀ alkylene group, a -C(O)CH₂-, -CH₂C(O)-, a divalent benzene ring which may be substituted with Y, a divalent pyridine ring which may be substituted with Y, a divalent biphenyl group which may be substituted with Y, a divalent naphthalene ring which may be substituted with Y, a divalent thiophene ring which may be substituted with Y, a divalent pyrrole ring which may be substituted with Y, a furan ring which may be substituted with Y, or a condensed hetero ring which may be substituted with Y, and R⁷⁴ a C₁-C₁₀ alkyl group, an acetyl group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y, or a condensed heteroaryl group which may be substituted with Y;

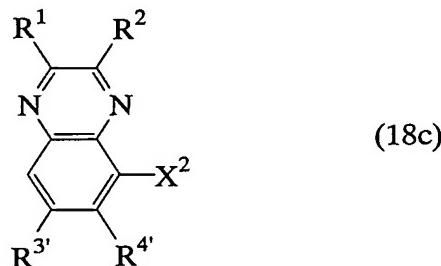
Y represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a

C_1-C_{10} cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different; and

Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C_1-C_{10} alkyl group, a C_1-C_{10} haloalkyl group, a C_1-C_{10} alkoxy group, a C_1-C_{10} cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different.

28. A method for making an electrode for an energy storage device according to claim 16, which method comprising
20 electrolytically polymerizing an aminoquinoxaline compound represented by the formula (18c) on a current collector electrode,

[Chemical Formula 23]



25 wherein R¹ and R² independently represent a hydrogen atom, a hydroxyl group, a C_1-C_{10} alkyl group, a C_1-C_{10} alkoxy group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y;

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with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y or a condensed heteroaryl group which may be substituted with Y provided that when R¹ and R² are, respectively, the above-defined
5 phenyl, pyridyl, biphenyl, naphthyl, thienyl, pyrrolyl, furyl or condensed heteroaryl group, these groups may be joined through a single bond;

R^{3'} and R^{4'} join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- ,
-OCH₂CH₂- , -CH₂OCH₂- , -OCH₂O- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- ,
10 -CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- ,
-CH₂CH₂CH₂O- , -OCH₂CH₂CH₂- , -CH₂CH₂OCH₂- , -CH₂OCH₂CH₂- , -CH₂OCH₂O- ,
-OCH₂CH₂O- , -SCH₂CH₂S- , -OCH₂CH₂S- , -SCH₂CH₂O- , -CH₂CH=CH- ,
-CH=CHCH₂- , -OCH=CH- , -CH=CHO- , -SCH=CH- , -CH=CHS- ,
15 -N(R')CH=CH- , -CH=CHN(R')- , -OCH=N- , -N=CHO- , -SCH=N- ,
-N=CHS- , -N(R')CH=N- , -N=CHN(R')- , -N(R')N=CH- , -CH=N(R')N- ,
-CH=CHCH=CH- , -OCH₂CH=CH- , -CH=CHCH₂O- , -N=CHCH=CH- ,
20 -CH=CHCH=N- , -N=CHCH=N- , -N=CHN=CH- , or -CH=NCH=N- wherein a hydrogen atom bonded to a carbon atom of these groups may be substituted with Y, and R' represents a hydrogen atom, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z, or a condensed heteroaryl group which may be substituted with Z;

X² represents -NH-R⁷³-NH₂ or -NH-R⁷⁴, in which R⁷³
30 represents a C₁-C₁₀ alkylene group, a -C(O)CH₂- , -CH₂C(O)- , a divalent benzene ring which may be substituted with Y, a divalent pyridine ring which may be substituted with Y, a divalent biphenyl group which may be substituted with Y, a divalent naphthalene ring which may be substituted with Y, a divalent thiophene ring which may be substituted with Y, a divalent pyrrole ring which may be substituted with Y, a furan ring which may be substituted with Y, or a condensed

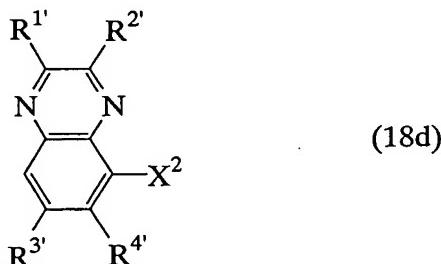
hetero ring which may be substituted with Y, and R⁷⁴ a C₁-C₁₀ alkyl group, an acetyl group, a phenyl group which may be substituted with Y, a pyridyl group which may be substituted with Y, a biphenyl group which may be substituted with Y, a naphthyl group which may be substituted with Y, a thienyl group which may be substituted with Y, a pyrrolyl group which may be substituted with Y, a furyl group which may be substituted with Y, or a condensed heteroaryl group which may be substituted with Y;

Y represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different; and

Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different.

29. A method for making an electrode for an energy storage device according to claim 17, which method comprising electrolytically polymerizing an aminoquinoxaline compound represented by the formula (18d) on a current collector 5 electrode,

[Chemical Formula 24]



wherein R¹' and R²' join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- , -OCH₂CH₂- , -CH₂OCH₂- , -OCH₂O- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- , 10 -CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- , -CH₂CH₂CH₂O- , -OCH₂CH₂CH₂- , -CH₂CH₂OCH₂- , -CH₂OCH₂CH₂- , -CH₂OCH₂O- , 15 -OCH₂CH₂O- , -SCH₂CH₂S- , -OCH₂CH₂S- , -SCH₂CH₂O- , -CH₂CH=CH- , -CH=CHCH₂- , -OCH=CH- , -CH=CHO- , -SCH=CH- , -CH=CHS- , -N(R')CH=CH- , 20 -CH=CHN(R')- , -OCH=N- , -N=CHO- , -SCH=N- , -N=CHS- , -N(R')CH=N- , -N=CHN(R')- , -N(R')N=CH- , -CH=N(R')N- , -CH=CHCH=CH- , -OCH₂CH=CH- , -CH=CHCH₂O- , -N=CHCH=CH- , 25 -CH=CHCH=N- , -N=CHCH=N- , -N=CHN=CH- , or -CH=NCH=N- wherein a hydrogen atom bonded to a carbon atom of these groups may be substituted with Y, and R' represents a hydrogen atom, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thiienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be substituted with Z, or a condensed heteroaryl group which may be substituted with Z;

R³' and R⁴' join together to form -CH₂CH₂CH₂- , -CH₂CH₂O- , -OCH₂CH₂- , -CH₂OCH₂- , -OCH₂O- , -CH₂CH₂S- , -SCH₂CH₂- , -CH₂SCH₂- , 30 -CH₂CH₂N(R')- , -N(R')CH₂CH₂- , -CH₂N(R')CH₂- , -CH₂CH₂CH₂CH₂- ,

-CH₂CH₂CH₂O-, -OCH₂CH₂CH₂-, -CH₂CH₂OCH₂-, -CH₂OCH₂CH₂-, -CH₂OCH₂O-,
-OCH₂CH₂O-, -SCH₂CH₂S-, -OCH₂CH₂S-, -SCH₂CH₂O-, -CH₂CH=CH-,
-CH=CHCH₂-, -OCH=CH-, -CH=CHO-, -SCH=CH-, -CH=CHS-,
-N(R')CH=CH-, -CH=CHN(R')-, -OCH=N-, -N=CHO-, -SCH=N-,
5 -N=CHS-, -N(R')CH=N-, -N=CHN(R')-, -N(R')N=CH-, -CH=N(R')N-,
-CH=CHCH=CH-, -OCH₂CH=CH-, -CH=CHCH₂O-, -N=CHCH=CH-,
-CH=CHCH=N-, -N=CHCH=N-, -N=CHN=CH-, or -CH=NCH=N- wherein a
hydrogen atom bonded to a carbon atom of these groups may be
10 substituted with Y, and R' represents a hydrogen atom, a
C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀
cyanoalkyl group, a phenyl group which may be substituted
with Z, a pyridyl group which may be substituted with Z, a
biphenyl group which may be substituted with Z, a naphthyl
15 group which may be substituted with Z, a thienyl group which
may be substituted with Z, a pyrrolyl group which may be
substituted with Z, a furyl group which may be substituted
with Z, or a condensed heteroaryl group which may be
substituted with Z;
X² represents -NH-R⁷³-NH₂ or -NH-R⁷⁴, in which R⁷³
20 represents a C₁-C₁₀ alkylene group, a -C(O)CH₂-, -CH₂C(O)-, a
divalent benzene ring which may be substituted with Y, a
divalent pyridine ring which may be substituted with Y, a
divalent biphenyl group which may be substituted with Y, a
divalent naphthalene ring which may be substituted with Y, a
25 divalent thiophene ring which may be substituted with Y, a
divalent pyrrole ring which may be substituted with Y, a
furan ring which may be substituted with Y, or a condensed
hetero ring which may be substituted with Y, and R⁷⁴ a C₁-C₁₀
alkyl group, an acetyl group, a phenyl group which may be
30 substituted with Y, a pyridyl group which may be substituted
with Y, a biphenyl group which may be substituted with Y, a
naphthyl group which may be substituted with Y, a thienyl
group which may be substituted with Y, a pyrrolyl group which
may be substituted with Y, a furyl group which may be
35 substituted with Y, or a condensed heteroaryl group which may
be substituted with Y;

Y represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group which may be
5 substituted with Z, a pyridyl group which may be substituted with Z, a biphenyl group which may be substituted with Z, a naphthyl group which may be substituted with Z, a thiienyl group which may be substituted with Z, a pyrrolyl group which may be substituted with Z, a furyl group which may be
10 substituted with Z or a condensed heteroaryl group which may be substituted with Z provided that if Y is two or more in number, Y may be the same or different; and

Z represents a halogen atom, a cyano group, a nitro group, an amino group, an epoxy group, a vinyl group, a C₁-C₁₀ alkyl group, a C₁-C₁₀ haloalkyl group, a C₁-C₁₀ alkoxy group, a C₁-C₁₀ cyanoalkyl group, a phenyl group, a biphenyl group, a naphthyl group, a thiienyl group, a pyrrolyl group, a furyl group or a condensed heteroaryl group provided that if Z is two or more in number, Z may be the same or different.